



Armed Forces College of Medicine

AFCM



Pharynx And Esophagus

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INTENDED LEARNING OBJECTIVES (ILO)



By the end of this lecture the student will be able to:

1. Identify extent & parts of pharynx
2. Recognize features of nasopharynx, oropharynx, & laryngopharynx
3. Identify Waldeyer's ring & its importance
4. Describe relations , blood supply, lymphatic drainage of palatine tonsils
5. Describe the arrangement , nerve supply & action of muscles of pharynx
6. Recognize beginning , course and termination of esophagus
7. Identify constrictions of esophagus

Lecture Plane



Definition of pharynx
Extent
Parts
Features
Layers
Muscles
Nerve supply
Blood supply

Pharynx

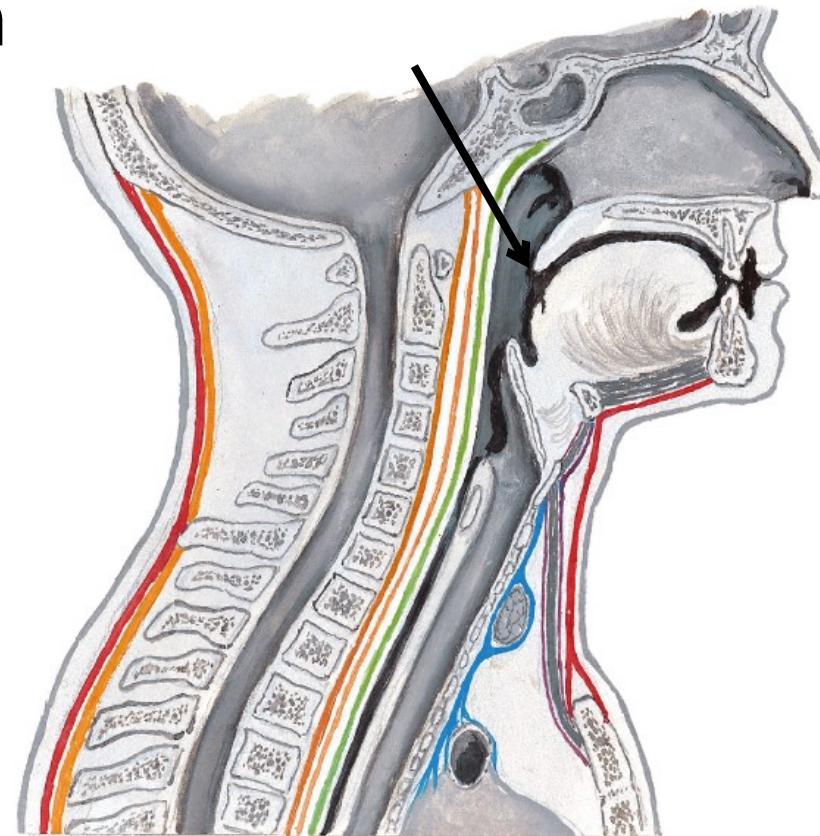
A muscular tube extending from the base of skull to the lower border of cricoid cartilage (6 cervical vert.)

It lacks the presence of anterior wall

Length : 5 inches

Relations

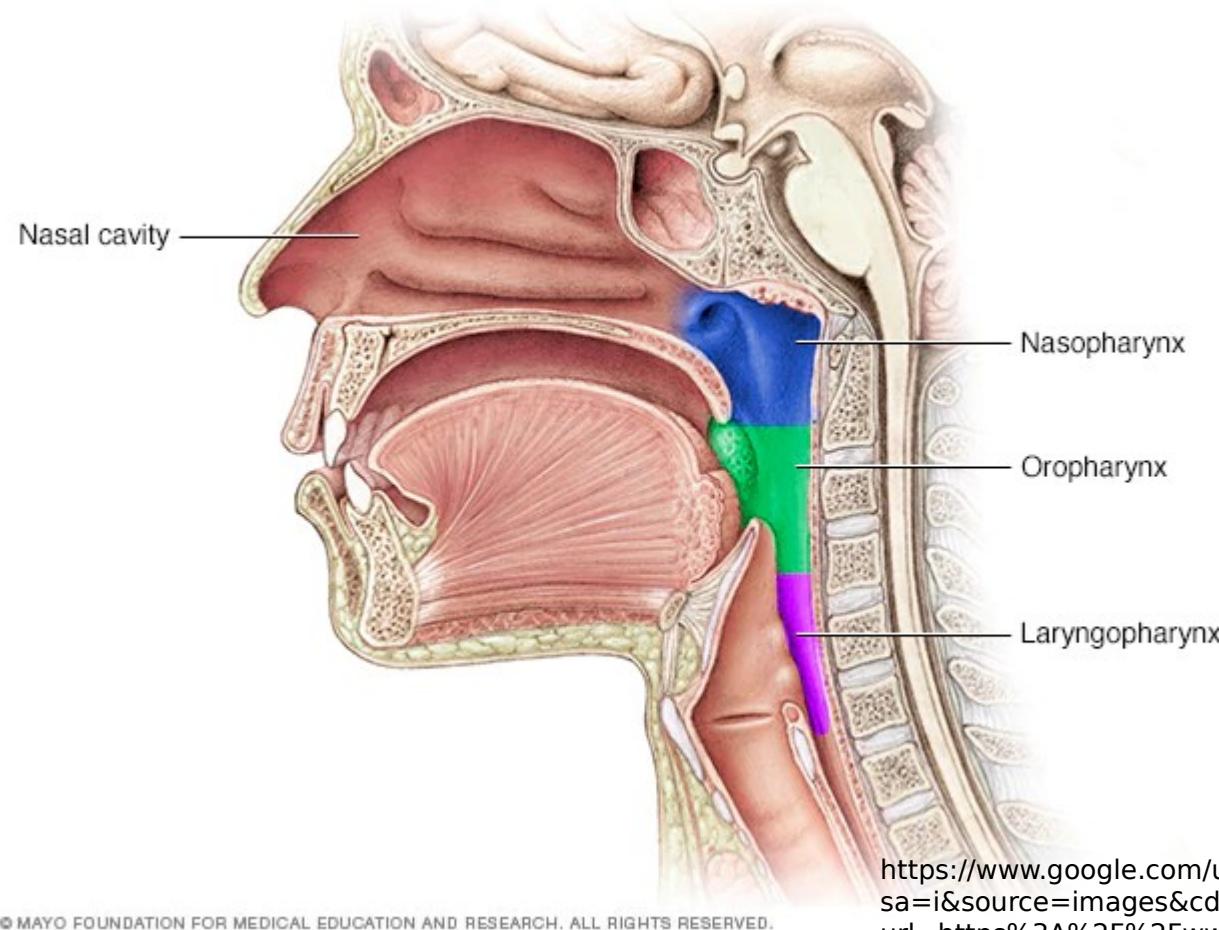
- Ant: nose , oral cavity & larynx
- Posterior : vertebral column
- Lateral : common carotid , internal & external carotid
- Superior: base of skull



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Divisions of pharynx



Pharynx is divided into

- **Nasopharynx,**
- **Oropharynx**
- **Laryngopharynx**

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url=https%3A%2F%2Fwww.mayoclinic.org%2Fparts-of-the-throat-pharynx%2Fimg-
20005644&psig=AOvVaw3SRGjtXtkfGzH9psWR9NpS&ust=1574529198394148](https://www.google.com/url?sa=i&source=images&cd=&ved=2ahUKEwjbsM7yqP7IAhUGmBQKHTsSAyEQjRx6BAgBEAQ&url=https%3A%2F%2Fwww.mayoclinic.org%2Fparts-of-the-throat-pharynx%2Fimg-20005644&psig=AOvVaw3SRGjtXtkfGzH9psWR9NpS&ust=1574529198394148)



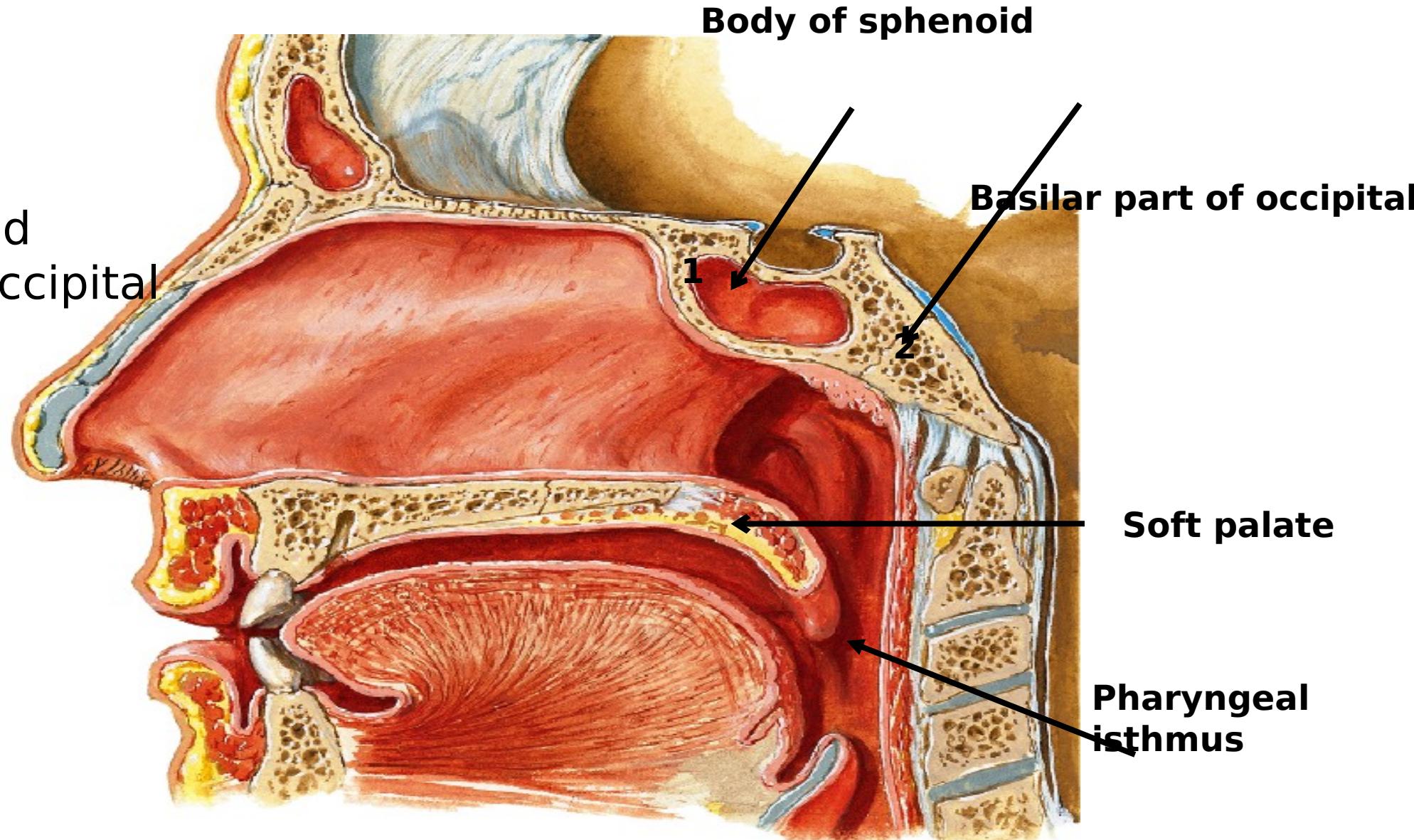
Nasopharynx

- **It lies behind nasal cavities**
- **Roof:** Body of sphenoid and basilar part of occipital bone
- **Floor:** Soft palate
- It communicates anteriorly with nasal cavity.
- It communicates inferiorly with oropharynx through
pharyngeal isthmus which lies between posterior wall of pharynx and soft palate

Nasopharynx

Base of skull

- Body of sphenoid
- basilar part of occipital bone





Features of Nasopharynx

□ **Pharyngeal tonsils:** aggregations of lymphoid tissue at roof , atrophies with age if enlarged it is called adenoids it obstructs posterior nasal openings& causes oral breathing & over crowding of teeth

□ **Opening of auditory tube:** in lateral wall

□ **Tubal elevation:** formed by posterior margin of auditory tube

□ **Salpingopharyngeal fold :** extends from the tubal elevation containing salpingopharyngeal muscle

□ **Pharyngeal recess:** behind the tubal elevation it is located



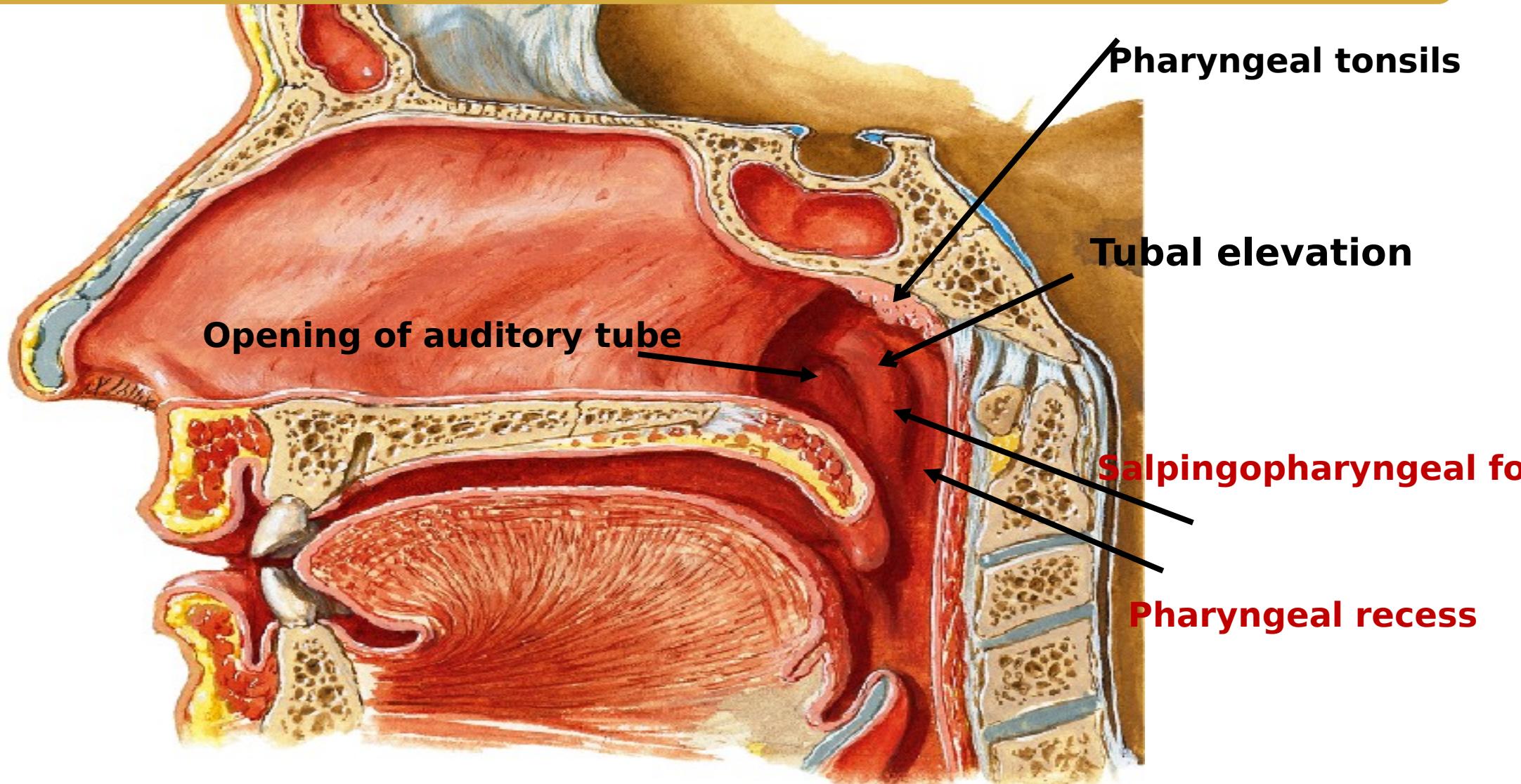
Features of Nasopharynx

Which feature is present in roof of nasopharynx

- A- pharyngeal tonsil
- B- opening of auditory tube
- C- tubal elevation
- D- tubal tonsil
- E- soft palate



Nasopharynx



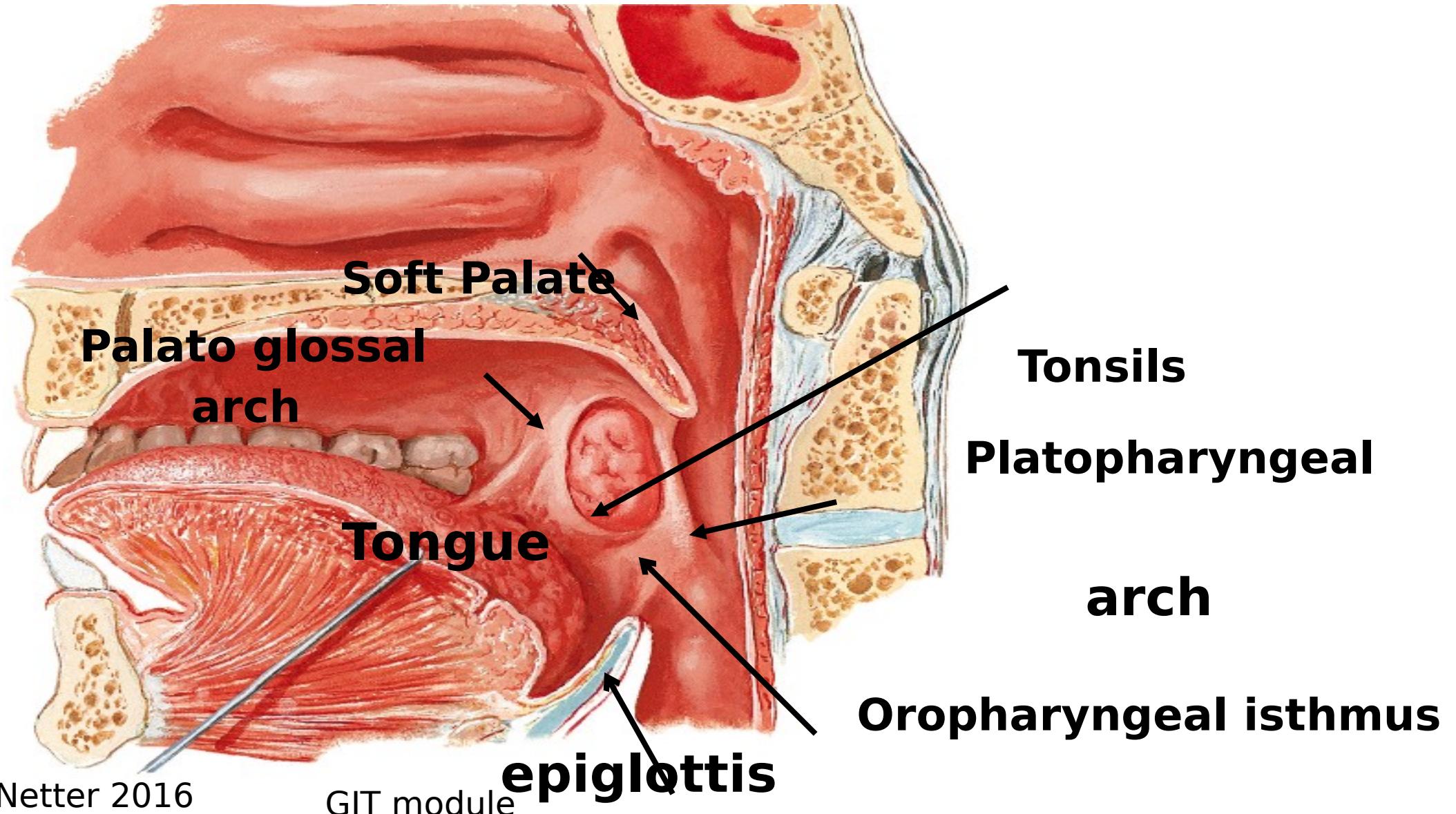


Oropharynx

- Lies behind oral cavity**
- Roof:** soft palate
- Floor:** posterior part of tongue
- Anterior wall:** absent it communicates with oral cavity via **oropharyngeal isthmus**
- Posterior wall:** 2&3 cervical vertebrae
- Lateral wall:** it shows palatoglossal and palato pharyngeal arches with palatine tonsils in between



Oropharynx





Tonsils

Lymphoid tissue in lateral wall of oropharynx oval in shape

- **Anterior border** : related to palatoglossal arch
- **Posterior border**: related to palatopharyngeal arch
- **Lateral surface**: has capsule& resting on tonsillar bed
- **Medial surface** : free surface which shows tonsillar crypts

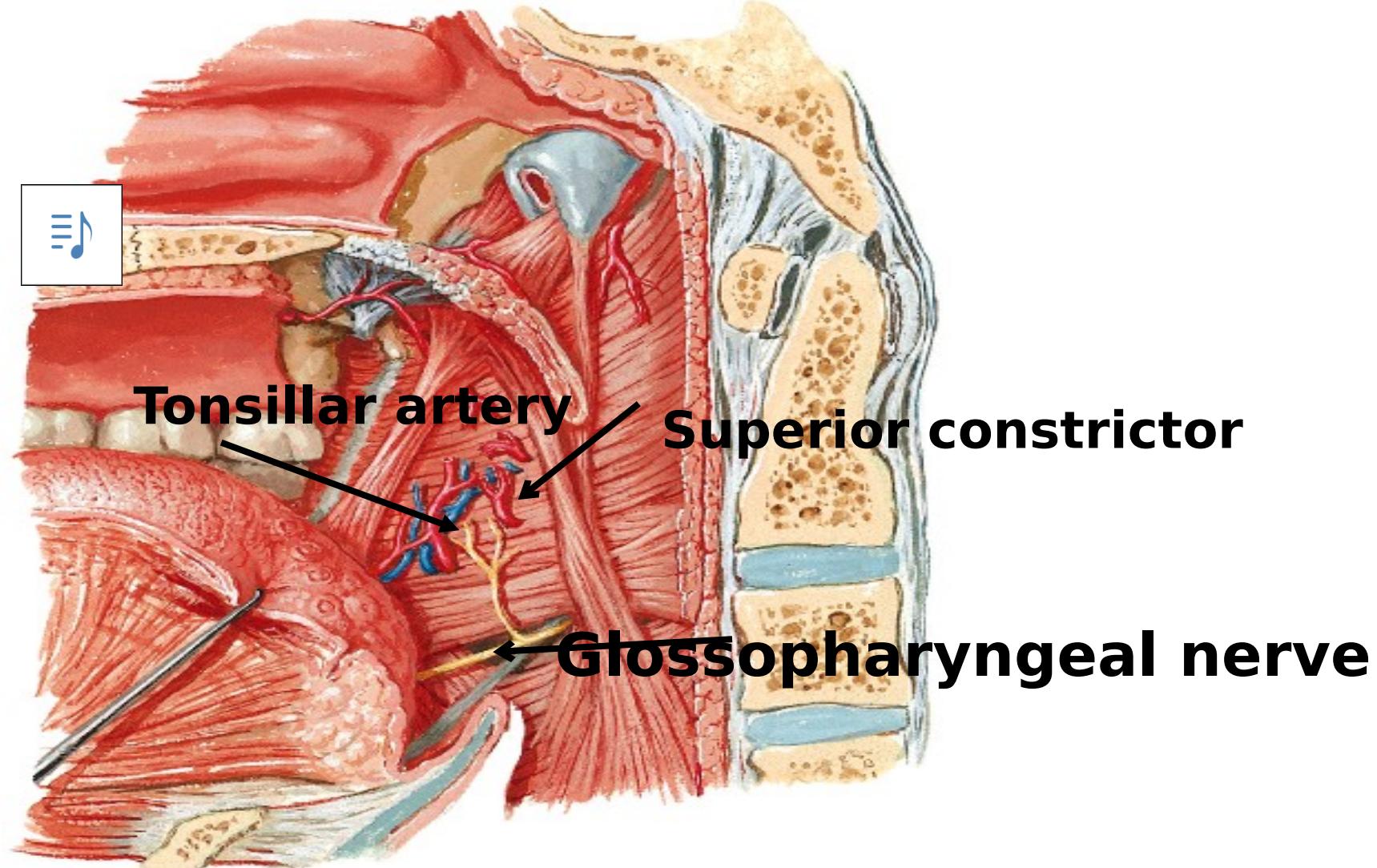


Tonsillar bed:

- Superior constrictor muscle
- Styloglossus
- Tonsillar artery & ascending palatine branches of facial artery
- Glossopharyngeal nerve
- Paratonsillar vein which causes bleeding after tonsillectomy



Oropharynx



Blood & nerve supply and lymphatic drainage of tonsils



Blood supply

- **Tonsillar** artery, from facial main supply
- Dorsal Lingual artery
- Greater palatine
- Ascending palatine
- Ascending pharyngeal

Venous drainage:

paratonsillar vein & pharyngeal vein & facial vein

Lymph drainage: juglodiagatric

Nerve supply: tonsillar branch of glossopharyngeal



Waldeyer's ring

A ring that encircles the entry of
digestive system & respiratory
system

It is formed by

- 1-Pharyngeal tonsils superior
- 2-Palatine tonsils lateral
- 3-Lingual tonsils inferior

Defense mechanism



Laryngopharynx

It extends from epiglottis to lower border of cricoid cartilage

Anterior wall: inlet of larynx and cricoid cartilage

Posterior wall: 3-6 cervical vertebrae

Lateral wall: it shows piriform fossa

Piriform fossa

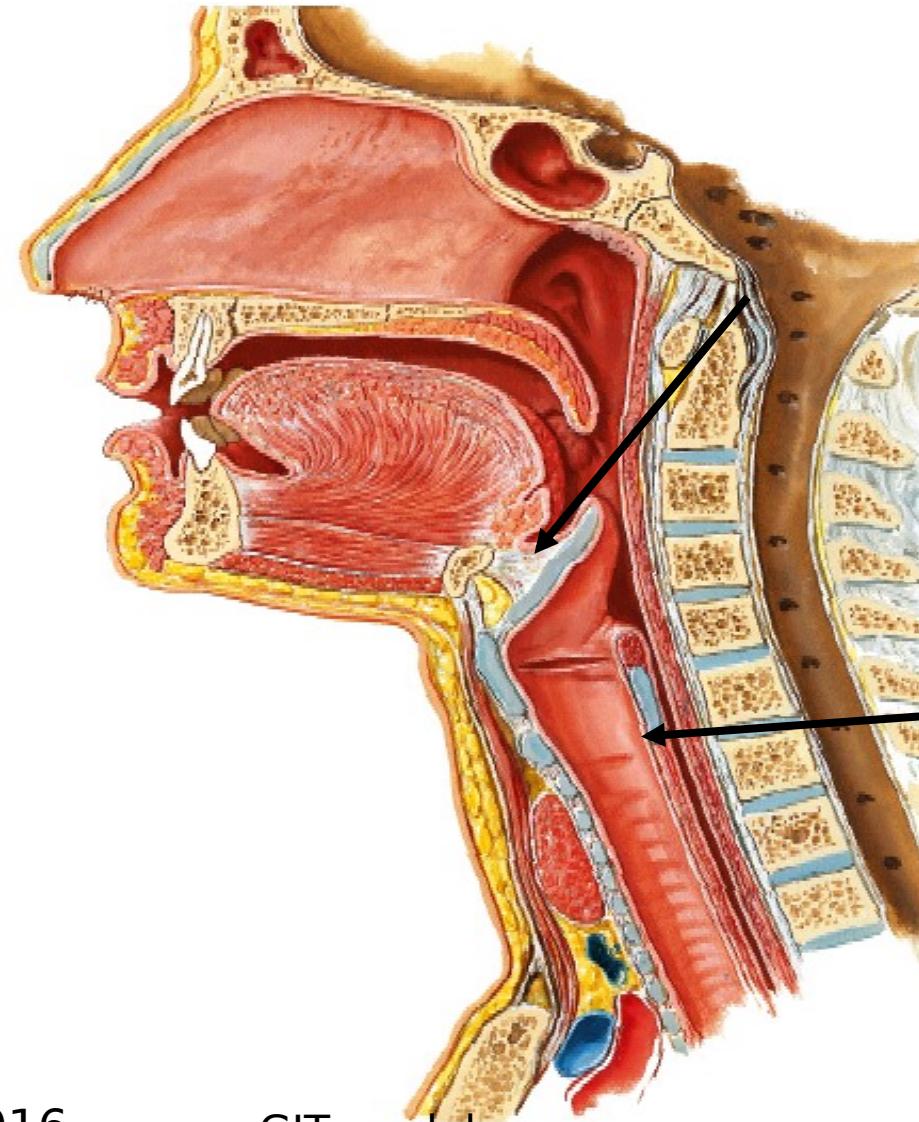
Medial : aryepiglottic fold

Lateral : thyrohyoid membrane

Site of foreign body impact that causes cough due to irritation of internal laryngeal nerve



laryngopharynx

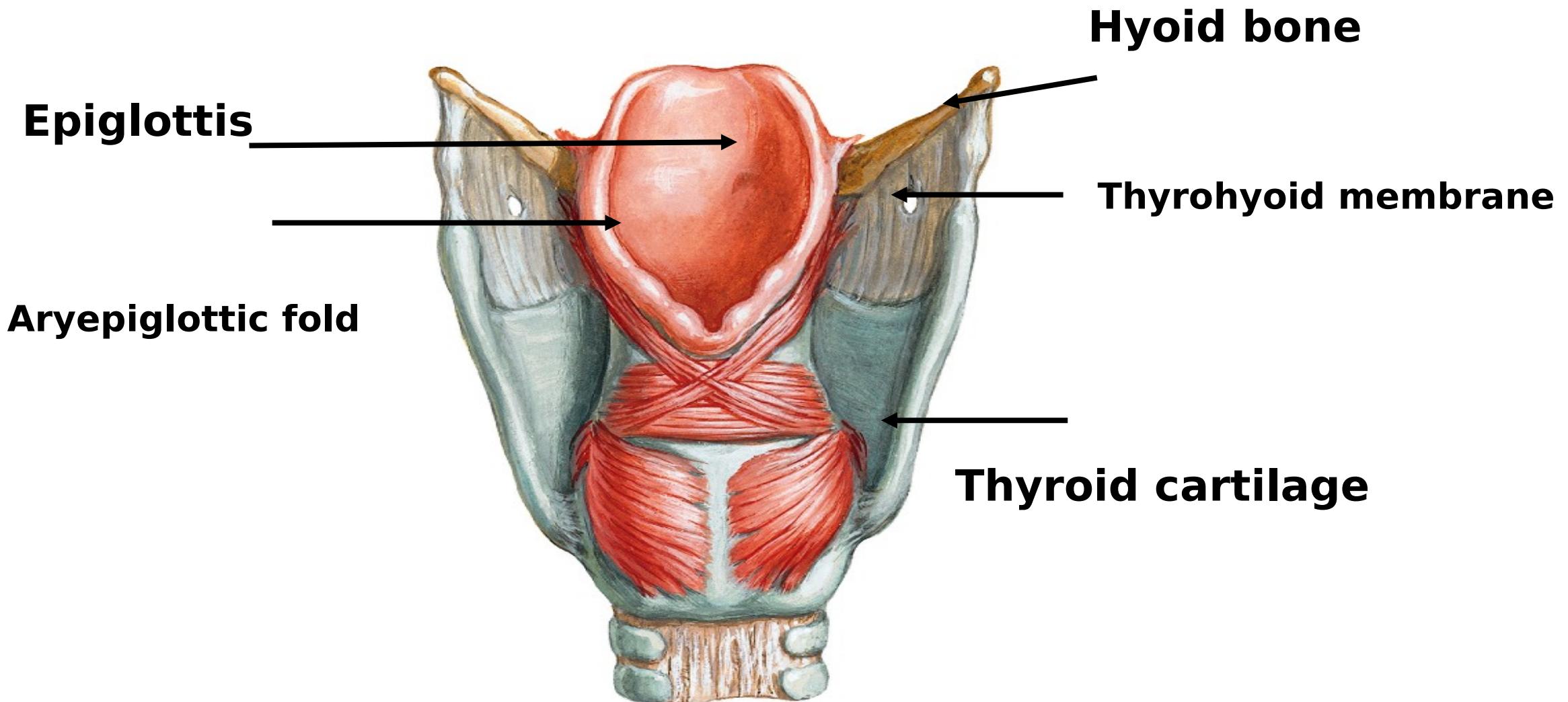


Epiglottis

**Cricoid
cartilage**



laryngopharynx



Interactive



Which nerve is related to pyriform fossa?

- A-recurrent laryngeal
- B- external laryngeal
- C- internal laryngeal
- D- vagus
- E- accessory

Muscles of pharynx



Constrictors

- Superior constrictor
- Middle constrictor
- Inferior constrictor

Longitudinal muscles

- Stylopharyngeus
- Platopharyngeus
- salpingiopharyngeus



Constrictors of pharynx

Superior constrictor

Ptergomandibular raphe , posterior end of mylohyoid line , pterygoid hammulus & medial pterygoid plate
(in same plane as buccinator)

Middle constrictor

Greater and lesser horn of hyoid bone and stylohyoid ligament

Inferior constrictor

Thyropharyngeus : oblique line of thyroid cartilage

Cricopharyngeus : side of cricoid cartilage

Insertion : by pharyngeal raphe into pharyngeal tubercle

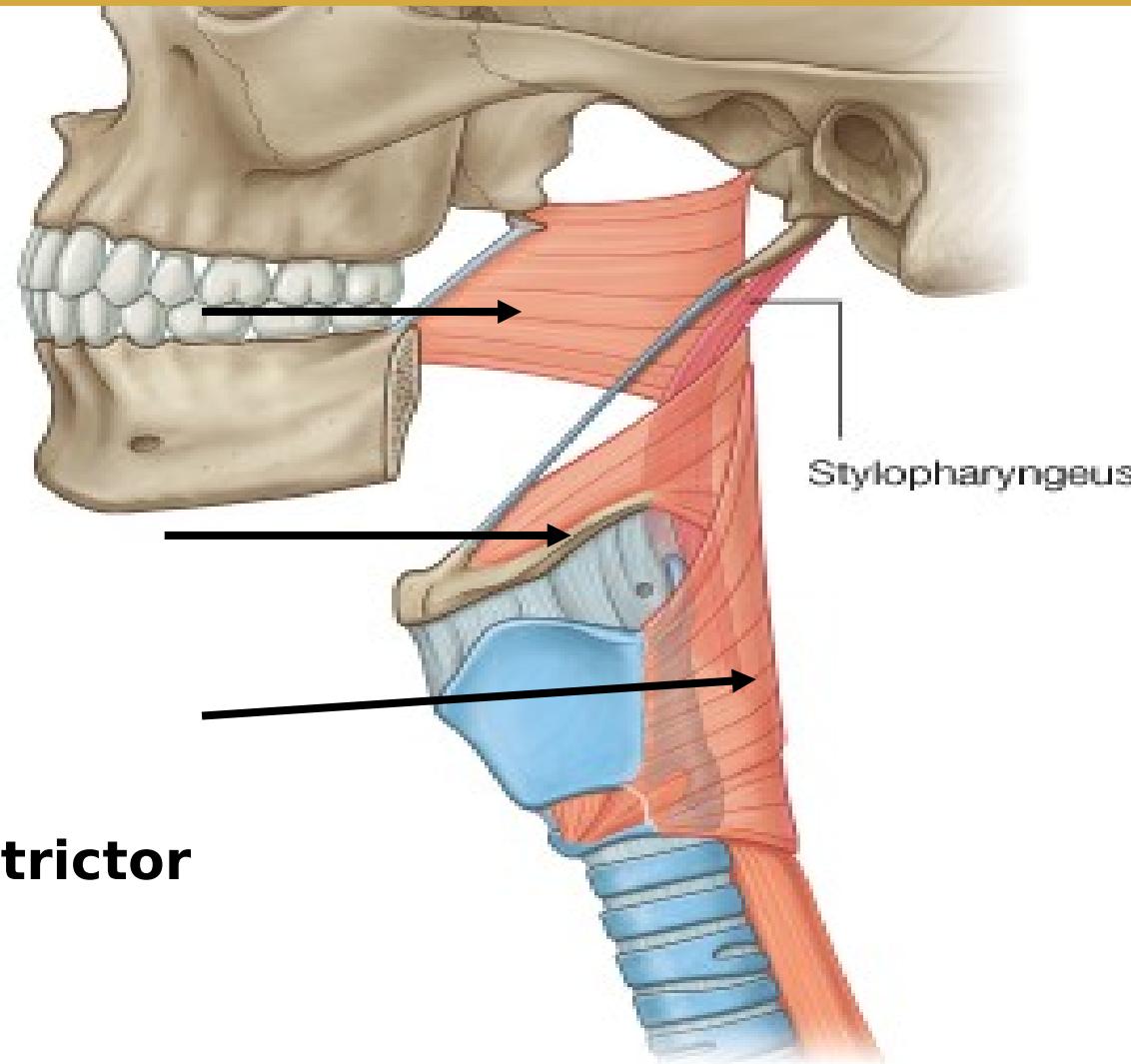


Constrictors of pharynx

**Superior
constrictor**

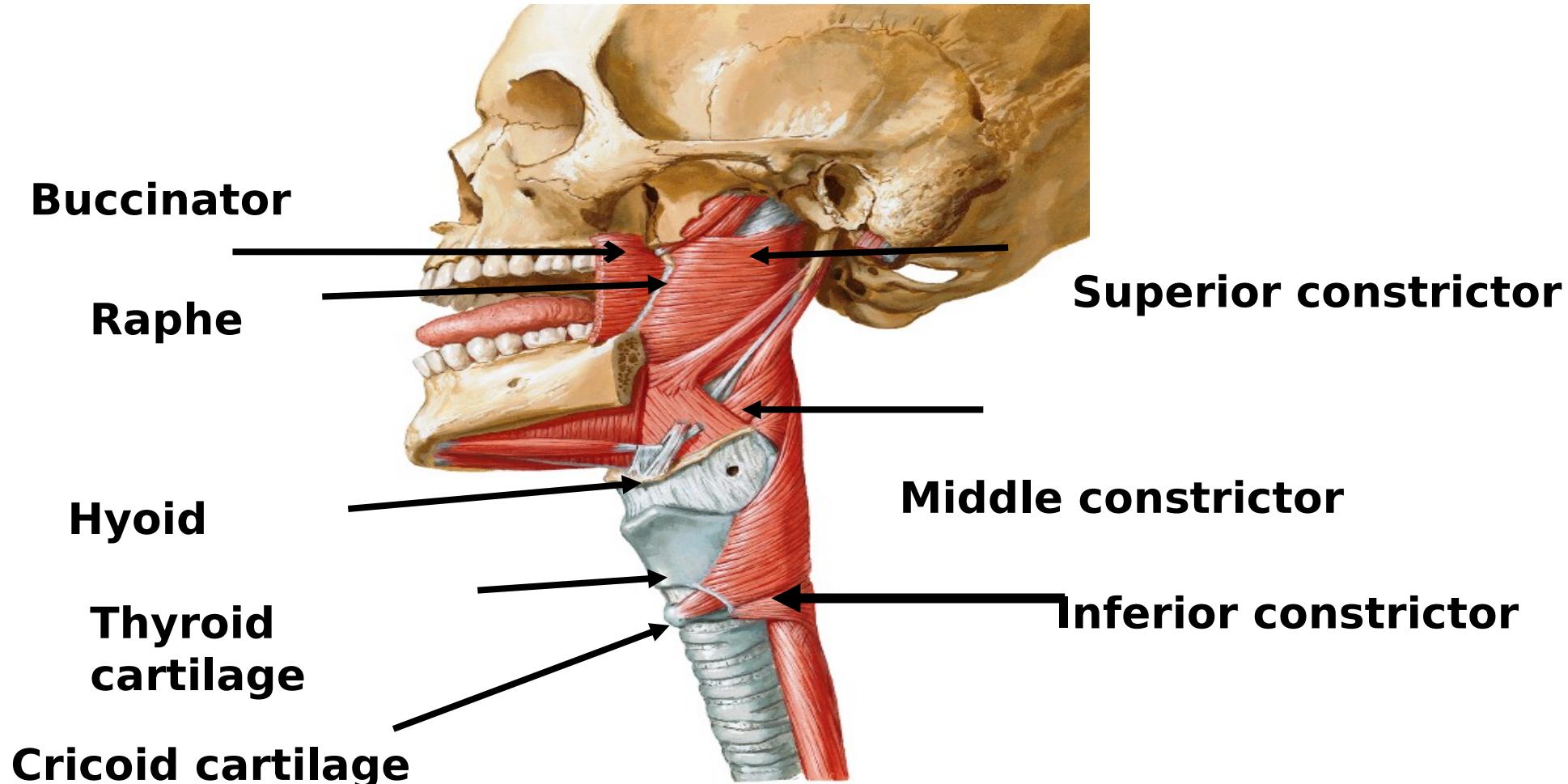
**Middle
constrictor**

Inferior constrictor



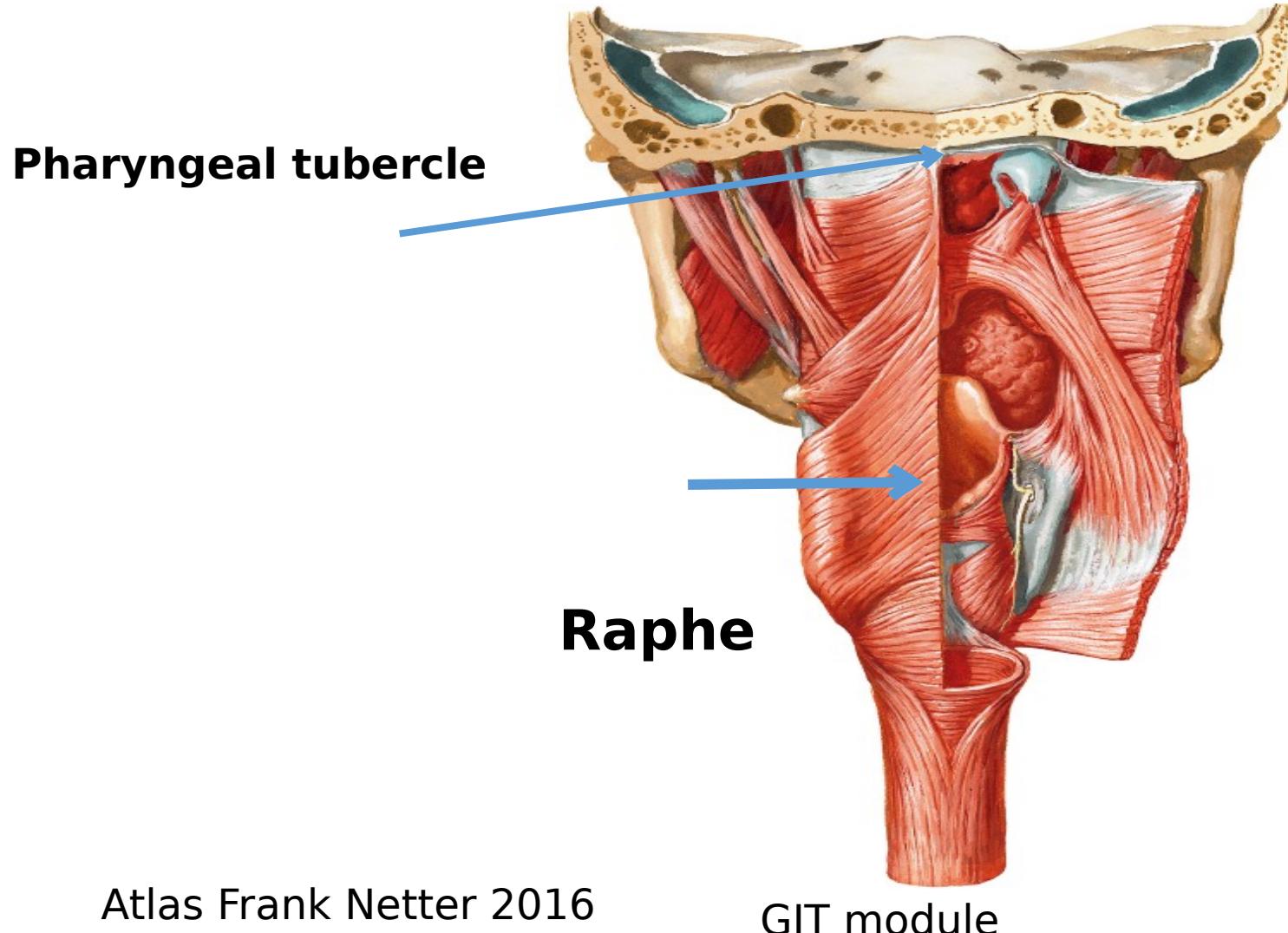


Constrictors of pharynx





Pharyngeal raphe



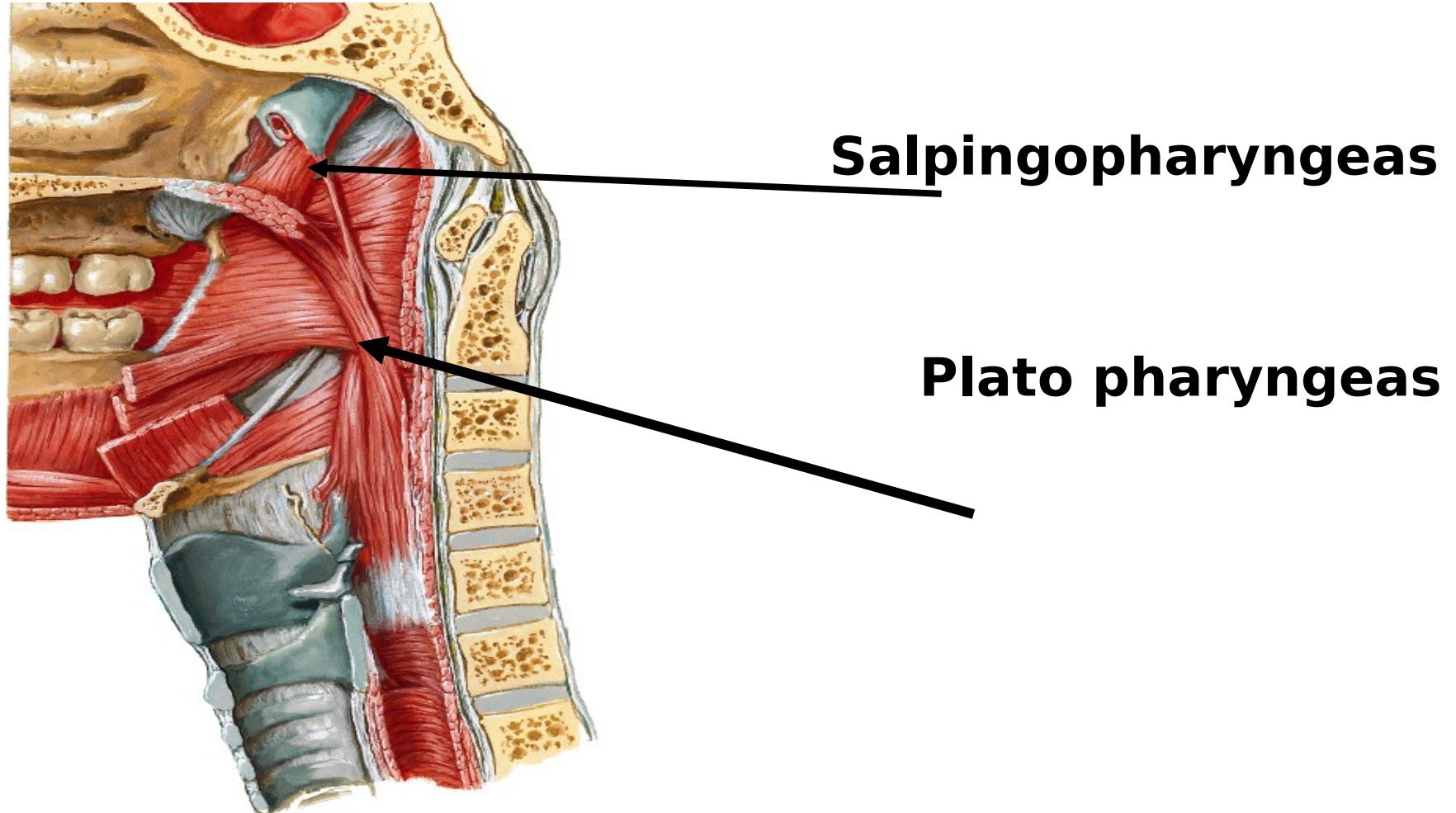
Longitudinal muscles



- **Stylopharyngeus:** from base of styloid process
- **Salpingopharyngeus:** anterior end of cartilage of auditory tube
- **Palatopharyngeus:** upper surface of palatine aponeurosis.

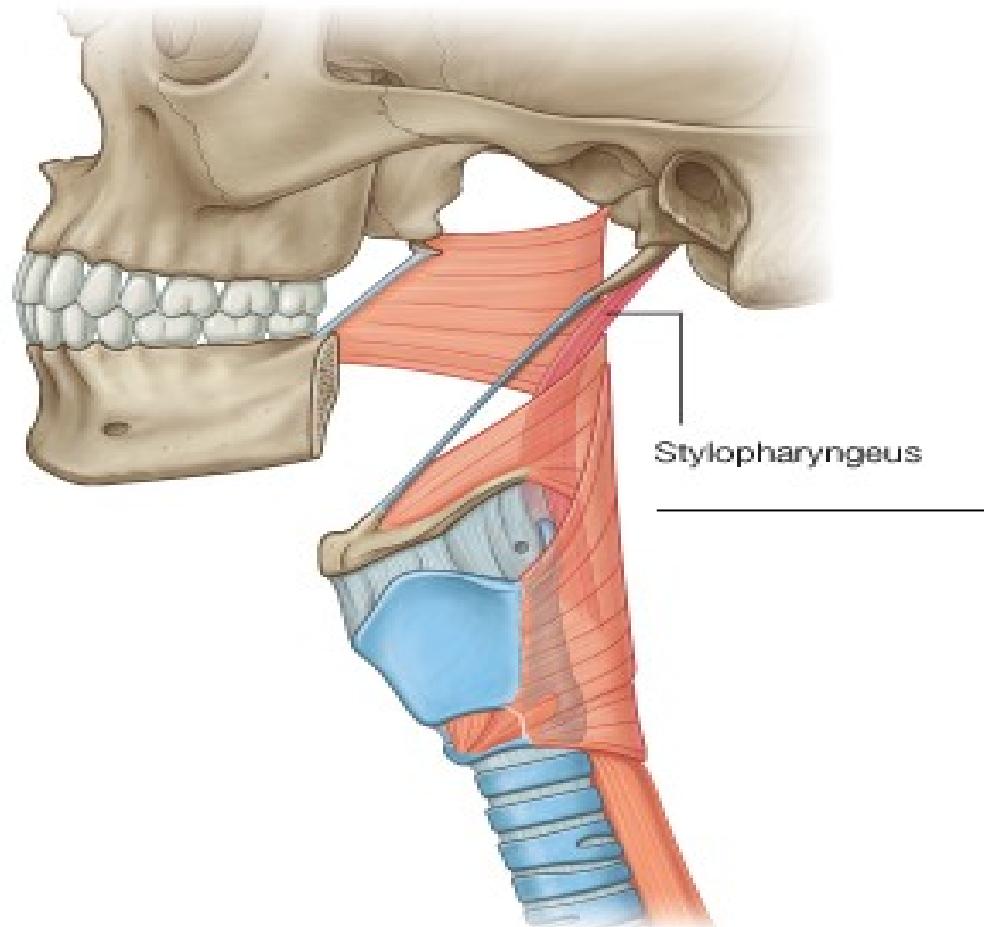
Insertion: in posterior border of thyroid cartilage

Longitudinal muscles of pharynx





Longitudinal muscles of pharynx



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GIT module

Longitudinal muscles of pharynx



Which nerve supplies stylopharyngeus ?

- A- vagus
- B- accessory
- C- glossopharyngeal
- D- facial
- E- mandibular

Action of Muscles of Pharynx



- **Superior , middle and thyropharyneal** part of inferior constrictor **propel** food downwards during swallowing
- **Cricopharyngeal part of inferior constrictor** is a **sphincter** to lower end of pharynx preventing suction of air into esophagus .it relaxes in end of 2 stage of swallowing to allow food to pass to esophagus
- **3 longitudinal muscles** pull pharynx & larynx **upwards** in 2 stage to close

Nerve supply of Pharynx



- All muscles of pharynx are supplied by **cranial accessory** joining **vagus** except **Stylopharyngeus** which is supplied by.....
- **Pharyngeal Plexus:** lies on **middle constrictor**. it is formed by cranial accessory, branches of glossopharyngeal and sympathetic branches from superior cervical sympathetic ganglia
- **Sensory nerve supply**
 - **Nasopharynx:** Maxillary nerve(5)
 - **Oropharynx:** Glossopharyngeal(9)
 - **Laryngopharynx:** Vagus(10)



Blood supply of pharynx

Blood supply

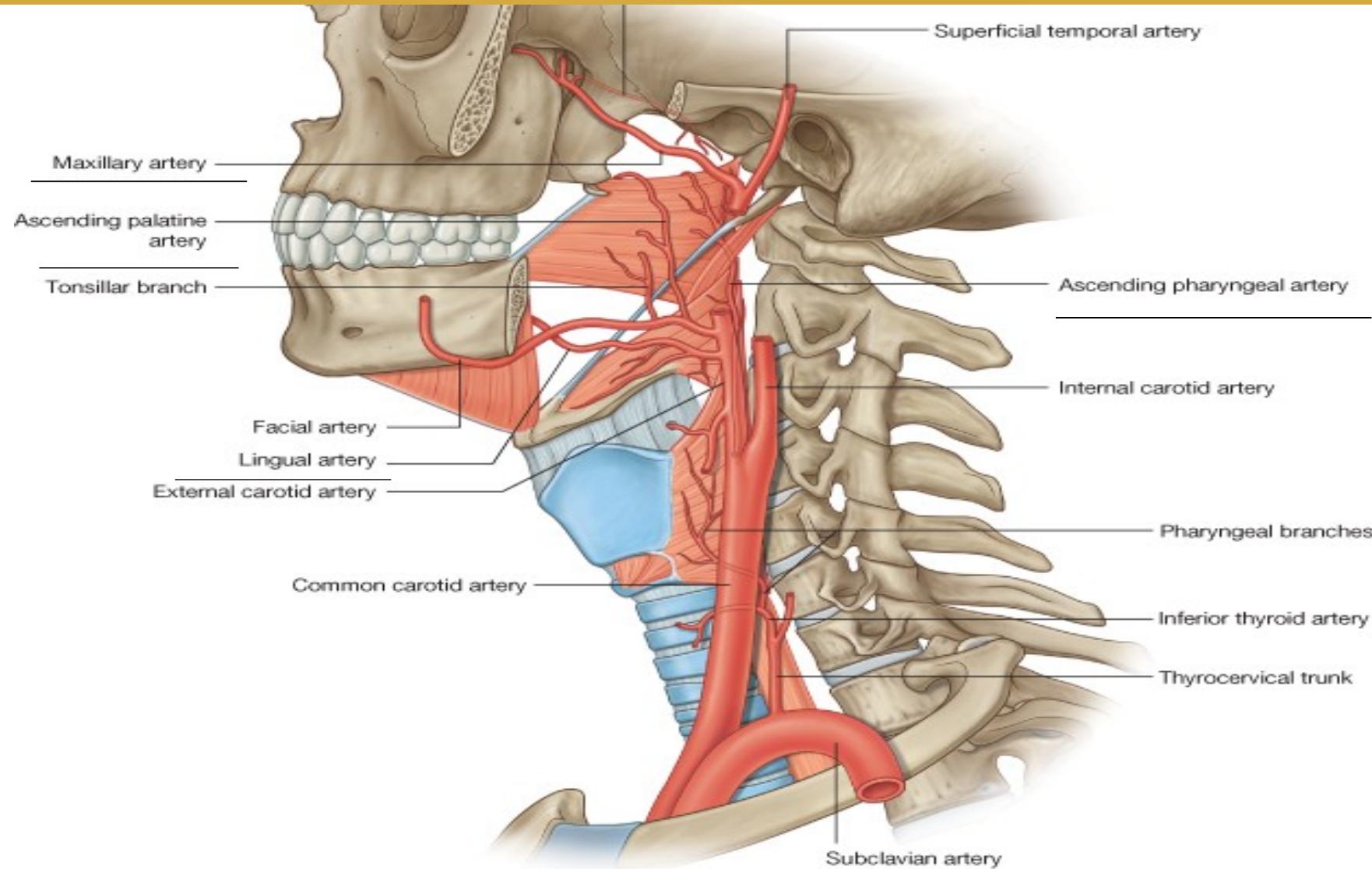
1. Ascending pharyngeal
2. Ascending palatine
3. Pharyngeal branch of maxillary
4. Dorsal lingual
5. Greater palatine
6. Tonsillar of facial
7. Superior & inferior laryngeal arteries

Venous drainage :

pharyngeal plexus which ends
in **Pterygoid venous plexus**



Blood supply of pharynx





Esophagus

- Direct continuation of pharynx
- Begins at cervical 6
- 25 cm in length
- It has course in neck, thorax
(superior & posterior mediastinum)
& abdomen
- Passes in diaphragm at level of T 10
one inch to left of median plane to
join stomach

Blood supply

Upper third : inferior thyroid artery

Middle third ; descending thoracic
aorta

Lower third : left gastric artery

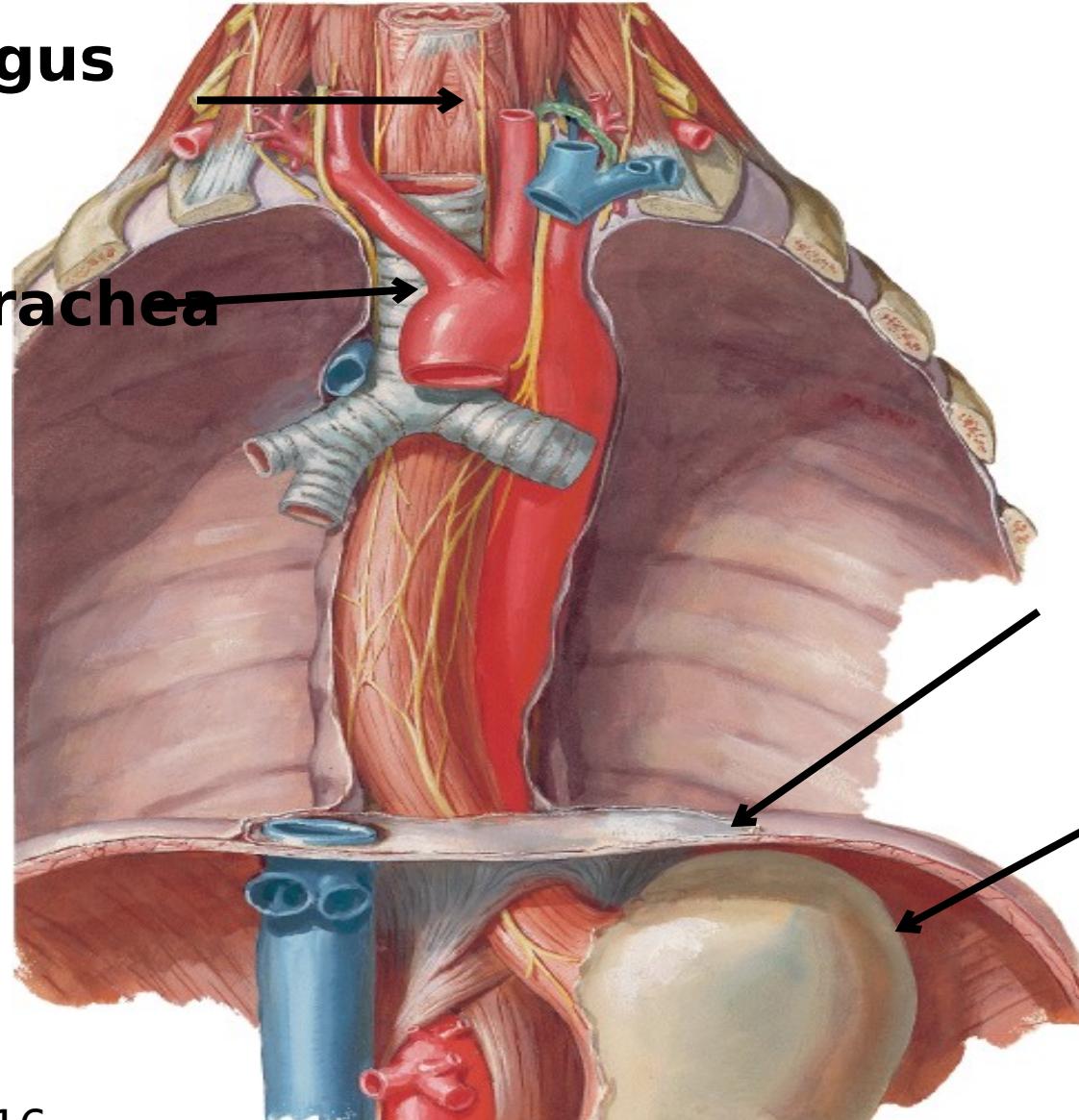
Venous drainage : upper third in

Esophagus



esophagus

Trachea

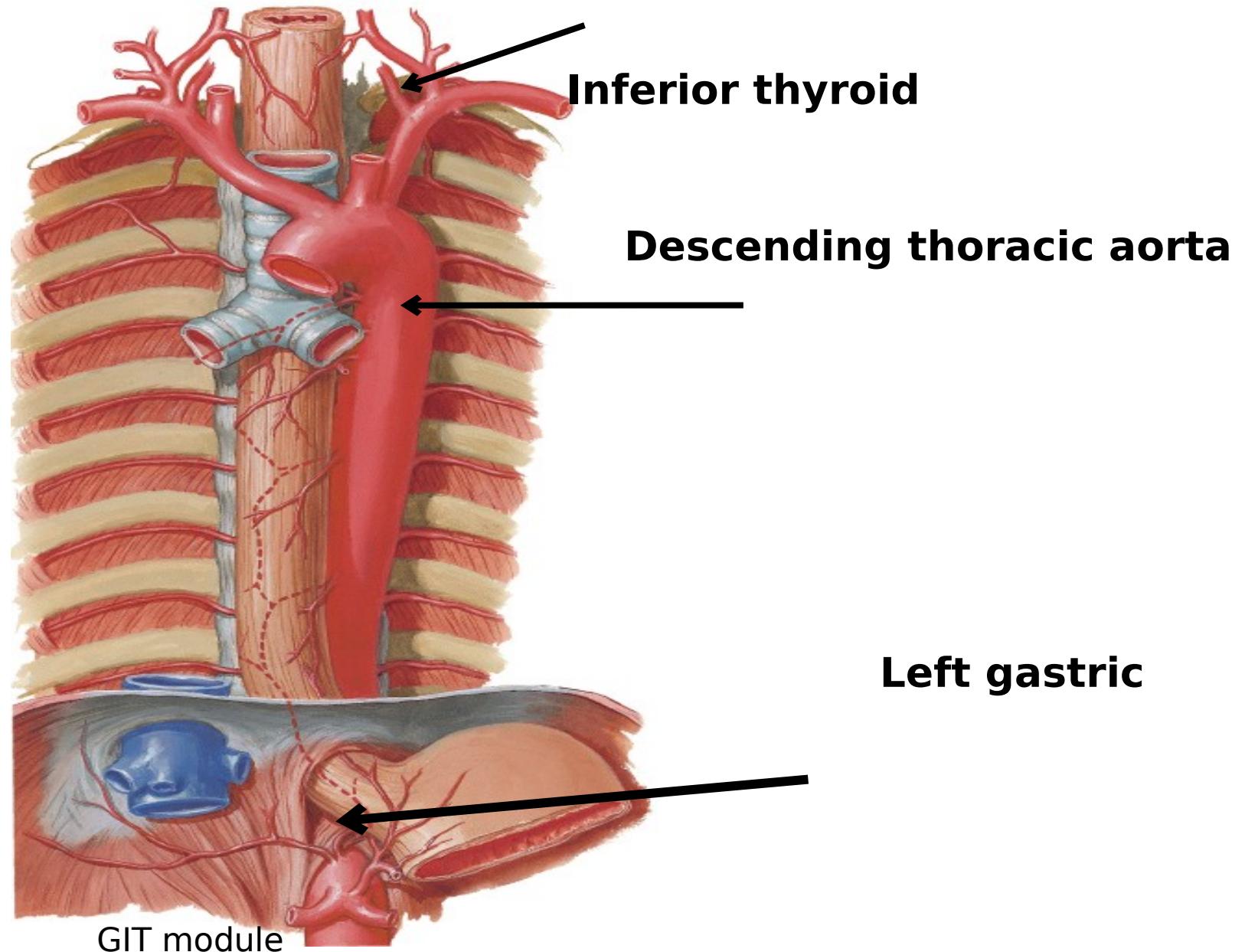


Diaphragm

Stomach



Esophagus



Constrictions of esophagus



Esophagus shows 3 **constrictions**

- 1- At junction with pharynx
- 2- Where aortic arch & left bronchus cross its anterior surface
- 3- When esophagus passes in diaphragm

**They are at 6, 10, 16 inches
from upper incisor
respectively**

- ❖ They are sites of foreign body lodge

Lecture Quiz



1. Enumerate the **blood supply of tonsils**
2. The junction between nasopharynx and oropharynx is called?

3. A muscle that prevents entry of air into esophagus

- a) Thyropharyngeus
- b) Cricopharyngeus
- c) Stylopharyngeus
- d) Platopharyngeus



SUGGESTED TEXTBOOKS

1. Clinical Anatomy by regions by Richard Snell